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AMBER: a PIC slice code for DARHT JEAN-LUC VAY,
WILLIAM FAWLEY, Lawrence Berkeley National Laboratory — The
accelerator for the second axis of the Dual Axis Radiographic Hydrody-
namic Test (DARHT) facility will produce a 4-kA, 20-MeV, 2-μs output
electron beam with a design goal of less than 1000 π mm-mrad normal-
ized transverse emittance and less than 0.5-mm beam centroid motion.
In order to study the beam dynamics throughout the accelerator, we
have developed a slice Particle-In-Cell code named AMBER, in which
the beam is modeled as a time-steady flow, subject to self, as well as
external, electrostatic and magnetostatic fields. The code follows the
evolution of a slice of the beam as it propagates through the DARHT
accelerator lattice, modeled as an assembly of pipes, solenoids and gaps.
In particular, we have paid careful attention to non-paraxial phenomena
that can contribute to nonlinear forces and possible emittance growth.
We will present the model and the numerical techniques implemented,
as well as some test cases and some preliminary results obtained when
studying emittance growth during the beam propagation.

☐ Prefer Oral Session
☒ Prefer Poster Session

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